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## MAMMALS COLLECTED BY THE LEGENDRE 1938 IRAN EXPEDITION

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Mammals secured by the Legendre Expedition comprise the only representative collection of Iran species in America at the present time. Relatively few mammal collectors have visited northern and western Persia and practically nothing was known about the mammal life in north-eastern Iran. The itinerary of the expedition was adequately covered by Mr. Sidney Legendre in the November 1939 issue of "Natural History."

The principal collecting localities, south-east of the Caspian Sea, were: The eastern end of the Main Koleh Peninsula, which is a narrow strip of land with mud flats on the south, a series of briar-covered sand dunes on the north and low wet reed beds covering most of the center; Dar Koleh, about sea level and 40 kilometers east of Astrabad, on the border of a thick forest of the Mazandaran and broken grassy plains, beyond which stretches the dust plains of the Turkman desert; Gouladah or Gulidow, a small Turkman village, about 3000 feet elevation, in open rolling grassy country and wooded valleys, south of the Gurgan River; Hairleigh and Dergermatie, high arid ridges of the Khorkout range, about 4000 feet elevation and 30 kilometers east of Gouladah, drainage north to the upper watershed of the Gurgan River; Dasht, a very small village on an arid plateau, about 3000 feet elevation, at the foot of a high ridge of the Khorkout range which is about 5000 feet elevation, the southern slope rocky and barren with stunted cedars and the northern slope heavily forested with deciduous trees, drainage southwest to the Gurgan River and east probably to the Intcha which is a tributary of the Atrek.

### *Pachyura etrusca* Savi

Pigmy White-toothed Shrew

A very small, slaty brown shrew; underparts pale drab-gray. Skull in general like *Crociodura* but differs in the presence of very small fourth upper unicuspid teeth.

Measurements of an immature specimen from Dar Koleh: total length, 65 mm.; tail vertebrae, 20; hind foot, 6. Skull: condylo-incisive length, 13.2; greatest breadth, 5.3; entire upper toothrow, 5.3.

Specimens: Dar Koleh, near Astrabad, 1.

### *Crociodura hyrcania*, new species

Hyrcania Long-tailed Shrew

TYPE.—No. 88738, Amer. Mus. Nat. Hist.; adult ♂; Turkman plains, about 60 kilometers northeast of Astrabad on the banks of the Gurgan River; altitude sea level; collector, G. G. Goodwin, October 30, 1938. The type is a skin and skull in good condition.

GENERAL CHARACTERS.—A small long-tailed shrew with large ears, about the size of *C. dinniki* Ognev from Stravopolis, Russia, but color darker; skull narrower and toothrow shorter; color pattern bearing a strong resemblance to *C. leucodon persica* Thomas but size much smaller; tail longer and ears larger than the latter.

DESCRIPTION.—Upperparts light mummy brown, the hairs deep neutral gray at base followed by a narrow band of light buff and tipped with mummy brown. Upperside of tail like back with scattered long white hairs. Underparts, including inner sides of fore and hind limbs and well up on sides of face and body, white, base of hairs, deep neutral gray; underside of tail, fore and hind feet, white to roots of hair; ears prominent and sparsely covered with fine whitish hairs mixed with mummy brown on upper half; vibrissae, upper black and lower white. Skull: without pronounced characters; rather narrow; second and third upper unicuspid teeth subequal, with a well-developed heel; upper profile almost a straight line.

MEASUREMENTS OF TYPE.—Total length, 100; head and body, 60; tail vertebrae, 40; hind foot including claws, 13; ear in dried skin, 6.5. Skull: greatest length, 17.5; condylo-incisive length, 18; greatest breadth, 8.25; width of palate across  $M^2$ , 5.5; width between infra-orbital foramina, 3; entire upper toothrow, 7.7.

REMARKS.—*Crocidura hyrcania* may be recognized by its long sharply bicolored tail, small size, prominent ears and extensive white coloring of underparts. It is darker in color than *C. dinniki* from which it is widely separated geographically, with a narrower and more slender skull. Ognev records a specimen of the latter from Tehai River, affluent to the Gorgan in the Province of Astrabad, which may be referable to the present species. *C. hyrcania* is smaller than *C. zarudnyi* (*titiana* preoccupied) Ognev from eastern Persia and needs no comparison with the *ilensis*, *russula* and *suaveolens* groups. Hyrcania is a wide, indefinite ancient district of Asia, south of the Caspian Sea and bounded on the east by the River Oxus.

#### *Crocidura leucodon persica* Thomas

Persian White-bellied Shrew

A large shrew with a relatively short bicolored tail, extensive white underparts and large white feet. It has a broad flattened skull as in typical *leucodon* but the unicuspid teeth in the Legendre collection specimens are less crowded, the second unicuspid tooth is slightly smaller than the third. The white of the feet extends well above the wrists and ankles.

Measurements of an adult male and female: total length, 120, 120; tail vertebrae, 35, 35; hind foot, 15, 15. Skull: condylo-incisive length, —, 20; greatest breadth, 9.9, 9.3; entire upper toothrow, 9.3, 9.2.

This shrew was taken at an elevation of 3200 feet under loose rock piles on the barren southern slopes of a mountain ridge of the Khorkout range. The principal vegetation was stunted cedar and sage brush.

Specimens: Dasht, Bujnurd district, 3.

#### *Crocidura suaveolens suaveolens* Pallas

Pallas Little White-toothed Shrew

A small cinnamon-brown shrew with tail about equal to half the length of head and

body, indistinctly bicolored; underparts buffy white, feet soiled whitish.

Measurements of two females from the Mazandaran: total length, 90, 94; tail vertebrae, 30, 35; hind foot including claws, 12, 12. Skull: greatest length, 17.2, 16.6; condylo-incisive length, 17.8, 17.1; greatest breadth, 8.2, 7.8; entire upper toothrow, 7.5, 7.4.

Two specimens, here provisionally referred to *suaveolens*, were collected on a mossy bank in a thick forest at about sea level. They agree in color and measurements with Ognev's description of the typical form.

Specimens: Dar Kaleh, near Astrabad in Mazandaran, 2.

#### *Crocidura gmelini* Pallas

Gmelin Shrew

A small shrew of the *suaveolens* group with tail sharply bicolored and about equal to half the length of head and body, ears small and almost concealed under fur; pelage thick and fine. Color of upperparts varying from drab to snuff brown, the hair dark neutral gray at base followed by a narrow band of light buff and tipped with drab; upperside of tail like back; underparts including fore and hind feet and well up on the sides of body, lips and side of face to base of ears, underside of tail, white or buffy white; the dark basal color showing through. Skull small, rostrum short and evenly rounded; second and third upper unicuspid teeth small, rather crowded and subequal.

Measurements of an adult male (No. 88740) and female (No. 88742), from Dasht: total length, 90, 90; tail vertebrae, 30, 30; hind foot including claws, 12, 12. Skull: greatest length, 16.8, 16.8; greatest breadth, 8.1, 8; greatest anteorbital breadth, 5.5, 5.35; least interorbital breadth, 3.65; entire upper toothrow, 7.6, 7.6.

A series of small shrews from the district of Bujnurd seem to coincide sufficiently well with Pallas' description of *S. gmelini* to establish the identity of that species. The type, according to Pallas, was captured by Gmelin the younger, in Hyrcania, a wide indefinite tract south of

the Caspian Sea and bounded on the east by the River Oxus. Caravan trails cross the low mountain passes through Bujnurd from Samarkand to Persia and this is a probable locality where Gmelin may have collected his specimen. Furthermore, the habitat shown in Pallas' plate is typical of this country. Specimens in spirits show a striking resemblance to Pallas' illustration of this shrew, especially in the color of the head, though the principal color is not so vivid but grayer and corresponds better with his description. One study specimen is stained with yellow on the underside and the tail is practically unicolored.

Specimens: Dasht, 85 kilometers west of Bujnurd, from an arid plateau 3200 feet elevation, 11 (5 in spirits).

#### *Crocidura astrabadensis*, new species

Astrabad White-toothed Shrew

TYPE.—No. 88735, Amer. Mus. Nat. Hist.; adult ♀; Dar Kaleh, a small community in a low deciduous forest country, about 40 kilometers east of Astrabad, Iran; altitude about sea level; collector, G. G. Goodwin, October 23, 1938. The type is a skin and skull in good condition. Besides the type there is one topotype.

GENERAL CHARACTERS.—A small-sized dark-colored shrew with nearly unicolored tail, ears prominent; underparts dusky; pelage short and close.

DESCRIPTION.—Color of type: entire upperparts uniform dark mummy brown, hairs without subterminal buffy band; underparts soiled buffy white, the hairs dark neutral gray from base for most of their length and lightly tipped with pinkish buff; fore and hind feet soiled whitish; tail like back above, slightly paler below. Skull relatively long and tooththrow short, second and third upper unicuspid teeth small, subequal and not crowded; rostrum evenly tapered.

Measurements of type and an adult male topotype (in parentheses): total length, 100 (100); tail vertebrae, 32 (35); hind foot including claws, 12 (12.5). Skull: greatest length, 17.7 (17.6); condylo-incisive length, 18.6 (18.3); greatest breadth, 8.5 (8.3); greatest anteorbital breadth, 5.6 (5.7); least interorbital breadth, 4 (3.8); entire maxillary tooththrow, 7.85 (7.9).

REMARKS.—*Crocidura astrabadensis* may be recognized by its close, short bicolored pelage, small size and dark underparts. It is very different from the *leucodon*, *russula* and *suaveolens* but may belong

to the *ilensis* group. The type series was taken in heavy undergrowth in semi-open country at the side of a small stream. Thomas' description of *C. r. caspica* from the southern coast of the Caspian Sea gives a similar color pattern to *astrabadensis* but the measurements are for a larger animal with condylobasal length of skull 21 mm. and upper tooththrow, 9.4. *Crocidura fumigata* de Filippi from Teheran is about equal in size or larger than *caspica* and color similarly dark. *C. zarudnyi* Ognev from eastern Persia is a pale gray-colored species with a long tail, 47.5 mm.; larger and very different from *astrabadensis*.

#### *Ursus arctos caucasicus* Smirnov

Caucasia Brown Bear

An adult male bear from the Elburz Mountains is here provisionally referred to *Ursus a. caucasicus*. Its color in general is about buckthorn brown, darkest on neck and shoulders; the hairs mummy brown broadly tipped with light buff, sides of body and limbs paler than back and hair more unicolored. Skull with moderately worn molars, forehead rather abruptly elevated behind rostrum; interpterygoid space narrow, molariform teeth large.

Measurements of adult male: length flat skin, 1810; width across fore limbs including claws, 2000. Skull: greatest length, 342.5; condylobasal length, 315; zygomatic width, 216; mastoid width, 159; postorbital constriction, 75; interorbital constriction, 80; width of palate across  $M^2$ , 84; alveoli of maxillary tooththrow, 117; last upper molar,  $35.9 \times 18.7$ .

REMARKS.—There seems to be little difference between the cranial measurements of the Elburz Mountains specimen and those of an adult male in the British Museum from Sweden. A series, however, may show that the Persian bear averages larger with a relatively higher forehead than the typical form. *U. a. persicus* Lonnberg from the Mazandaran has a similarly elevated forehead but is described as a smaller race with narrow palate, larger teeth and longer tooththrow.

Specimens: Chalus Kelandost, altitude



7500 feet, 2 (male adult skin and skull and immature skull).

***Meles canescens* Blanford**

Persian Badger

This badger is similar in general color pattern to the European form but is smaller and paler in color. The skull and teeth are noticeably smaller than typical *meles*, the bony palate between the last molars is more concave and the zygomatic arches are relatively narrower.

Measurements of an adult male and female from Gouladah, from dried skin: total length, 890, 855; tail vertebrae, 110, 120; hind foot including claws, 80, 75. Skull: greatest length 130.5, 125.6; condylobasal length, 122.3, 117.2; zygomatic breadth, 77.1, 71.3; interorbital constriction 28.2, 26.5; postorbital constriction, 22.5, 22.2; mastoid width, 59.3, 56; maxillary toothrow, 41.2, 40; width of palate across last molar, 40.1, 38.5.

REMARKS.—The badger is not uncommon in northern Iran. Two specimens were taken in open rolling country and both agree closely with Blanford's type description in color and cranial dimensions.

Specimens: Gouladah, district of Bujnurd, altitude 3000 feet, 2.

***Calogale persicus* Gray**

Persian Mongoose

A small mongoose with coarse buffy gray pelage, hairs light buff with three bands and tip dark brown; in worn pelage the dark brown bands fade to a tawny shade.

Measurements of two dried skins from Iran without specific locality: total length, 700, 590; tail, 280, 230; hind foot including claws, 638, 545.

REMARKS.—Two flat skins bought in Teheran were said to have probably come from Mesched. One is smaller and more tawny than the other which may be age or seasonal variation. Both specimens are here provisionally referred to *C. persicus*.

Specimens: Iran, 2 (skins without skulls).

***Vulpes flavescens* Gray**

Persian Desert Fox

A medium-sized pale yellowish fox. Top of head and middle of back cinnamon buff; sides of body and neck light buff, hairs subterminally tipped with blackish brown and mixed with black; a small area in front and a larger area behind fore limbs buffy white from base of hair, lightly tipped with black; a blackish spot in front of eye; inside of ear white, outside blackish, base clear pinkish buff; uppersides of fore limbs and feet like sides of body; upperside of hind feet buffy white or grizzled; tail paler than back, washed with black, tip white. Lower lips, throat and a broad line down abdomen, slaty black. Skull slender, rostrum elongate, premolars well separated, palate narrow.

MEASUREMENTS.—Adult male from Turkman desert, near Astrabad: total length, 960; tail vertebrae, 395; hind foot including claws, 155. Skull: greatest length, 136.2; condylobasal length, 130.9; zygomatic breadth, 67.8; postorbital constriction, 22.3; interorbital constriction, 23.4; width of rostrum, 17.5; width of palate across carnassials, 35.1; maxillary toothrow, 64.1.

REMARKS.—Two skins from the Turkman desert agree closely with Gray's description. *V. flavescens* has a color pattern similar to that of *V. leucopus* but is a larger and lighter colored animal. Blanford's *V. persica* is probably synonymous with *V. flavescens* said to be from Persia. *V. v. splendens* Thomas from Astrabad, Iran, is a rich tawny forest species and very different to the fox found on the Turkman desert.

Specimens: Turkman desert, 2 (1 skin and skull, 1 skin).

***Thos aureus* Linnaeus**

Persian Jackal

The jackal is a robust fox-like animal with a rather short tail. Mazandaran specimens are a bright reddish color. An adult male is rich ochraceous buff on back, heavily overlaid with black-tipped hairs, this color grading to a clear golden tawny on fore and hind limbs and feet.

MEASUREMENTS.—Adult male: total

length, 885; tail vertebrae, 119; hind foot including claws, 160. Skull: condylobasal length, 150; zygomatic breadth, 89; interorbital constriction, 28.1; postorbital constriction, 29.5; width of palate across  $M^1$ , 51.8; maxillary toothrow, 68.

REMARKS.—Jackals were common in the semi-open country along the southern shore of the Caspian Sea. The bright red color of the Mazandaran jackals is apparently also applicable to specimens from Trebizond and Armenia. Specimens from southern Iran along the Persian Gulf and from the lower Tigris and Euphrates regions are pale buff-colored. The contrast in color between the northern and southern specimens is probably no more than a color phase. A lighter color in the southern specimens would be expected, owing to the hotter and drier climate and the effect of the desert sun and lack of shade.

Specimens: Dar Kaleh, near Astrabad, 3.

### *Felis constantina caudata* Gray

#### Short-tailed Desert Cat

A medium-sized grayish cat with numerous elongated dark brown spots. Similar in color pattern to *F. c. ornata* Gray but color grayer and spots darker and more distinct; tail shorter, about equal or longer than half the length of head and body.

Measurements of dried skin from Turkman desert: total length, 870; tail vertebrae, 280.

REMARKS.—There is probably an appreciable amount of individual color variation in this race of cats. The present specimen is here referred to *caudata*. The spots are relatively large and widely separated and it has four broken transverse lines across anterior part of abdomen. The general color and the spots are darker than the average and the tail is shorter though it may be incomplete.

Specimens: Turkman desert, near Astrabad, 1 (skin without skull).

### *Panthera pardus saxicolor* Pocock

#### Persian Leopard

Distinguished from Indian races by its much paler color, the general tint being

gray with a pale buff or sandy wash. The color pattern consists of relatively large and well-spaced rosettes.

Measurements of tanned skin from Gouladah: total length, 1770; tail, 800.

REMARKS.—A rather faded stuffed skin was purchased from the natives at Gouladah. It has a pale buffy ground color and rather large well-separated rosettes and thick woolly pelage characteristic of the Persian leopard.

Specimen: Gouladah, 1 (skin).

### *Glis glis caspius* Satunin

#### Caspian Dormouse

Specimens of a large dormouse from Dar Kaleh, about 60 kilometers east of Astrabad, are here referred to Satunin's Kopet-Dagh race. The type was stuffed, with only a fragment of skull in the skin. They agree with the external measurements in the type description but Satunin could give no cranial characters and the pelage description is not diagnostic. The present series in fresh fall pelage vary in color from dark drab to drab, paler on front of head, sides in some individuals lightly washed with buff. A faint buffy area below ear, described as a distinct rusty zone in type description; ears well haired, narrow dark ring around eye and tip of nose slaty black; tail clove brown except at base where it grades into color of back, and a well-defined white median ventral line; underparts including toes of hind feet white, fore feet white with a median brown stripe to base of toes. Skull short with a short evenly tapered rostrum, palate broad and molariform teeth large.

Measurements of an adult male and female: total length, 250, 270; tail vertebrae, 135, 141; hind foot including claws, 30, 31. Skull: greatest length, 36.3, 36.5; basilar length, 28.8, 29.4; length of nasals, 11.4, 11.4; zygomatic breadth, 20, 22.1; interorbital breadth, 5, 4.9; diastema, 8, 8.6; alveoli upper toothrow, 7.5, 7.4.

REMARKS.—This dormouse was found inhabiting the deciduous forests, at about sea level, near Astrabad, and was feeding on an abundant crop of acorns that were about ripe.

Specimens: Dar Kaleh, near Astrabad, 8.

***Glis glis petruccii* Goodwin**

Petrucci Dormouse

A comparatively small dormouse similar in external and cranial characters to *Glis g. caspius* from Dar Kaleh but much smaller.

Measurements of type, semi-adult: total length, 220; tail vertebrae, 100; hind foot including claws, 27. Skull: greatest length, 31.5; condylobasal length, 30; zygomatic breadth, 19.6; interorbital breadth, 4.8; length of nasals, 10; alveoli of upper toothrow, 6.5; diastema, 6.8.

REMARKS.—The type was taken on November 4, under some blackberry bushes in a valley of oak trees at an elevation of 3000 feet. Several days trapping yielded no further specimens which indicated that they had gone into hibernation.

Specimens: Gouladah, about 120 kilometers west of Astrabad, 1.

***Glis glis* subspecies?**

Skins of four large dormice were sent to me by a fur dealer and said to have been trapped in the hill country near Astrabad. They are similar in color and pelage texture to typical *Glis glis* from Switzerland in August pelage but the fur is somewhat longer.

Measurements of flat skins, probably well stretched, are about: total length, 390; tail vertebrae, 150. The breadth of the ear is the only authentic measurement and that is 14.1, much wider than the Dar Kaleh specimens of *caspius* which do not average more than 11.5 and about equal to the width in the typical European *glis*.

The skins are cut off at the feet and the fur dealer claimed that he had several hundred similar pelts for sale.

Specimens: Mazandaran, 4 (flat skins).

***Cricetulus phaeus* Pallas**

Little Gray Hamster

In color this little hamster varies from drab gray to pinkish buff washed with black. Underparts, including feet and usually the tail, white. In some of the

Iran specimens the darker color of back extends along upperside of tail.

Measurements of an adult male from Turkman plains and an adult male and female from Dasht: total length, 130, 135, 130; tail vertebrae, 20, 25, 20; hind foot including claws, 16, 16, 16. Skull: greatest length, 27.7, 28.1, 27.4; basal length, 24.3, 23.7, 23.3; length of nasals, 10.1, 10, 10; zygomatic width, 14.2, 14, 14; interorbital width, 4.3, 4.2, 4.2; greatest width of braincase, 11.9, 11.3, 12.5; alveoli length of upper toothrow, 3.9, 4.1, 3.6.

External measurements of northeastern Iran specimens are somewhat greater than those of the type from Stalingrad. Blanford noted the slightly larger size of the Persian hamsters, but both he and Thomas referred their Persian specimens to *phaeus*. A comparison of cranial characters, however, may separate the Persian little hamster as a geographical race characterized by a broad and well-inflated braincase and well-rounded upper profile. The large braincase in the Persian specimen is apparent when compared with specimens from north of the Aral Sea and referred by me to *C. migratorius*.

Specimens: Turkman plains, 1; Dasht, 8.

***Meriones (Parameriones) persicus gurganensis* Goodwin**

Gurgan Bushy Tailed Gerbil

A medium-sized buff-colored gerbil with soft pelage and white underparts; tail, longer than head and body, with a brush of long dusky hairs from tip for about half its length; underparts including feet white; soles of feet naked; underside of tail irregularly blotched with buffy and white.

Measurements of the type and an adult female from Dasht: total length, 325, 300; tail vertebrae, 175, 150; hind foot, 43, 40. Skull: greatest length, 42.1, 41.2; condylobasal length, 37.5, 37.2; interorbital width, 6.7, 7; zygomatic width, 21.5, 21; alveoli of upper toothrow, 6.1, 6.5; length of nasals, 17.5, 16.5; bullae, 15.3 × 10, 14.2 × 10.

This bushy tailed gerbil was found inhabiting the barren rocky mountain



ridges at about 3000 feet elevation. Specimens from the headwaters of the Gurgan are smaller and paler in color than typical *persicus* from southern Persia. They are about the size of *suschkini* from the Great Balkan Mountains but differ in color and cranial characters.

Specimens: Dergermatie, 1; Dasht, 4.

***Pallasiomys erythrouros maxeratis***  
Heptner

Turkman Gerbil

Similar in color and cranial characters to *P. e. erythrouros* but much smaller with whiter underparts and feet; underside of tail for most of its length clear clay color.

Measurements of two adult males from the Turkman plains: total length, 260, 250; tail vertebrae, 130, 130; hind foot including claws, 33, 34. Skull: greatest length, 36, 35.8; zygomatic width, 20, 19.2; interorbital breadth, 6.5, 6.4; alveoli upper molar series, 5.1, 5; bullae,  $14.8 \times 9.6$ ; suprameatal triangle,  $4.4 \times 2.6$ .

This small gerbil was found inhabiting the low mud plains near the banks of the Gurgan River at about sea level.

Specimens: Turkman plains, near As-trabad, 6 (3 in spirits).

***Pallasiomys erythrouros erythrouros***  
Gray

Afghan Gerbil

A moderately large cinnamon-buff-colored gerbil with fairly soft thick pelage, tail about equal to length of head and body, clay color mixed with black hairs which become longer and more abundant above toward tip forming a black pencil; feet light buff; soles of hind feet hairy except on posterior half of tarsus. Underparts creamy white, base of hair deep neutral gray; bullae very large.

Measurements of adult male from Dasht (tip of tail missing): head and body, 150; hind foot, 37. Skull: greatest length, 42.4; interorbital width, 7.3; zygomatic width, 23.8; length of nasals, 15.7; alveoli of upper molar series, 5.8; bullae,  $16.2 \times 11.3$ ; suprameatal triangle,  $4.8 \times 2.8$ .

The only specimen of Afghan gerbil

was taken on an arid desert plateau at an elevation of 3200 feet. It agrees in all essential characters with typical *erythrouros* including the distinct transverse fold on last upper molar.

Specimen: Dasht, 1.

***Pallasiomys iranensis*** Goodwin

Iran Gerbil

A medium-sized rather slender gerbil with fine dense grayish pelage; proximal median area of soles of hind feet naked. Underparts including fore and hind feet white, basal portion of hair dusky except on chin and throat where it is white to roots of hair. Skull superficially similar to *P. erythrouros* but smaller with more inflated bullae and larger teeth, last molar without indication of rudimentary transverse ridge.

Measurements of the type (dried skin), adult male: total length, 300; tail vertebrae, 128; hind foot including claws, 35. Skull: greatest length, 40.5; condylo-incisive length, 36.9; interorbital width, 6.6; zygomatic width, 22; length of nasal, 15.1; alveoli upper molar series, 6.2; bullae,  $16 \times 10.5$ .

The Iran gerbil is an inhabitant of the high plateau desert country of northeastern Iran.

Specimens: Dasht, 1; Maravih, 1.

***Rhombomys opimus sodalis*** Goodwin

Elburz Giant Gerbil

A large robust pinkish cinnamon gerbil. Color similar to *P. erythrouros* but feet and claws larger. Skull very different, more massive and bullae smaller.

Measurements of adult male and female from Maravih: total length, 320, 300; tail vertebrae, 140, 135; hind foot including claws, 45, 43. Skull: greatest length, 45.9, 43; condylo-incisive length, 41, 39.1; interorbital breadth, 8, 7.6; zygomatic width, 25.8, 25.8; alveoli of upper molar series, 7.5, 7.

The Elburz gerbil is larger than typical *opimus* from the sandy wastes on the northeastern shore of the Aral Sea, smaller and lighter colored than *R. o. funicolor* from Syr-Daria. This large gerbil was found

in large colonies inhabiting the upland desert regions. It seems to be local in its distribution and diurnal in habits.

Specimens: Maravih, 23 (12 in spirits); Dasht, 6.

***Microtus socialis paradoxus* Ognev**

Transcaspiian Short-tailed Vole

A rather large vole with short, almost unicolor tail and soft thick pelage; general color tawny olive, darkened by blackish tips of hairs. On some adult specimens there is an irregular bright buffy lateral stripe; tail buffy white with an indistinct narrow brownish dorsal line. Fore and hind feet and underparts creamy white.

Measurements of an adult male and female from Khorkout mountains and an adult female from Gouladah: total length, 130, 150, 130; tail vertebrae, 20, 20, 23; hind foot including claws, 20, 22, 19. Skull: condylo-incisive length, 28.5, 29.5, 28; condylobasal length, 28, 28.5, 27; interorbital width, 4.2, 4.4, 4.2; zygomatic width, 16.5, 17.4, 16.3; length of bullae, 9, 9.6, 8.6; alveoli upper molar series, 6.4, 6.6, 6.3.

Specimens from the Khorkout mountain region are a little larger than those from Gouladah and Dasht and also show slight cranial differences which are probably local variations. The present series are smaller than *M. irani* from Shiraz and larger than typical specimens of *M. paradoxus* from Kopet-Dagh but nearer the latter.

Specimens: Dergermatie, 6; Gouladah, 1; Dasht, 2.

***Microtus arvalis khorkoutensis*, new subspecies**

Khorkout Vole

TYPE.—No. 88764, Amer. Mus. Nat. Hist.; adult ♀; deciduous forest of Khorkout range near Dasht, district of Bujnurd, northeastern Iran; altitude 5000 feet; collector, G. G. Goodwin, November 22, 1938. The type is a skin and skull in good condition. Besides the type there are two adult ♀ topotypes.

GENERAL CHARACTERS.—Similar to *M. arvalis* but larger, skull relatively longer, bullae larger, very different from *M. transcaspicus* and smaller than *ilaeus*.

DESCRIPTION.—Color, above, bistre, hairs blackish mouse-gray for most of their length, followed by a narrow band of pale ochraceous

tawny, lightly tipped with black and mixed with long black hairs; sides of body paler than back; underparts light buff with dark basal color of hair showing through; fore and hind feet drab; tail mummy brown above, whitish below, the line of demarcation not well defined. Skull similar in shape to *arvalis* but larger and bullae more swollen; molar teeth essentially as in *arvalis*, M<sup>2</sup> without posterior internal loop but triangles larger; incisors with a distinct but shallow groove down anterior surface.

Measurements of type and an adult and subadult female in parentheses: total length, 150 (145, 140); tail vertebrae, 35 (35, 30); hind foot including claws, 19 (19, 20). Skull: condylo-incisive length, 26.4 (26.1, 25.3); basal length, 24.7 (24.5, 23.5); palatal length, 15 (15.1, 14); length of nasals, 7.6 (7.1, 6.9); interorbital breadth, 3.7 (3.6, 3.3); zygomatic breadth, 15.5 (15.5, 14.3); length of upper molar series, 6.5 (6.5, 6.5).

*Microtus a. khorkoutensis* was taken on the forested slope near the summit of a high ridge of the Khorkout range. *M. mystacinus* de Fillippi from the valley of the Lar is a very small vole, with total length (specimen in spirits) about 88.5; tail, 19; planta, 14.4; apparently much smaller than the present race. Other than size I find no distinguishing characters or cranial dimensions published on de Fillippi's species. *M. transcaspicus* Satunin is a very different species with four inner and four outer angles on M<sup>3</sup> and two outer and three inner angles on M<sub>2</sub>. *M. irani* Thomas is a much larger vole similar to *M. s. paradoxus* Ognev.

***Microtus hyrcania*, new species**

Hyrkania Vole

TYPE.—No. 88760, Amer. Mus. Nat. Hist.; adult ♂; Gouladah, open undulating country halfway between Astrabad and Bujnurd on the south side of the Gurgan watershed, northeastern Iran; altitude 3000 feet; collector, G. G. Goodwin, November 5, 1938. The type is a skin and skull in good condition.

GENERAL CHARACTERS.—A small vole about the size and color of *M. arvalis* with a rather hairy, sharply bicolored tail and distinctive cranial characters.

DESCRIPTION.—Color of upperparts snuff brown, the hair deep neutral gray from base for most of its length, broadly tipped with pinkish buff and mixed with long black hairs; underparts buffy white, the dark basal color of hair showing through; fore and hind feet drab; tail clove brown above, below and sides light buff, the line of demarcation sharply defined. Skull rather short and broad, depressed in interorbital region, nasals broad anteriorly and



tapering posteriorly to a point; bullae large; molar teeth with rather large triangles;  $M^2$  with a rudimentary postero-internal loop;  $M^3$  with two inner, two outer re-entrant angles and a rounded posterior loop, narrowed to a neck anteriorly.

Measurements of type: total length, 135; tail vertebrae, 33; hind foot including claws, 19.5. Skull: condylo-incisive length, 25.4; basal length, 23.4; length of nasals, 7; breadth anteriorly, 3.1; zygomatic breadth, 15; interorbital breadth, 3.4; interparietal,  $3.6 \times 5.8$ ; bullae,  $7.7 \times 5.5$ ; upper molar series alveoli, 6.

REMARKS.—*Microtus hyrcania* was taken at the side of a small stream in an isolated wooded valley. Its principal distinguishing characters are a sharply bicolored tail, wedge-shaped nasals, depressed interorbital region, large bullae and the pattern of the last upper molar. Externally, except for its brighter color and more hairy and sharply bicolored tail, it is not unlike *khorkoutensis* but has a much shorter skull than the latter, more depressed interorbital region, more sharply tapered nasals and very different  $M^3$ , though the variation of the pattern of the other molars could be within the range of individual variation.

### *Ellobius fuscocapillus legendrei*, new subspecies

TYPE.—No. 88747, Amer. Mus. Nat. Hist.; adult ♂; Turkman plains, Iran, about 60 kilometers east of Astrabad; altitude about sea level; collector, G. G. Goodwin, October 25, 1938. The type is a skin and skull in fair condition.

GENERAL CHARACTERS.—A medium-sized rich buff-colored vole with moderately large skull, rudimentary interparietal, molariform teeth as in *E. fuscocapillus*; the complicated shape of the last molar quite as in that species.

DESCRIPTION.—Upperparts pinkish buff, the tips of hairs on middorsal area darkened with cinnamon buff, top of head from nose to ears glossy black; underparts washed with pale pinkish buff; base of hair dark neutral gray; feet and tail buffy white. Skull: braincase relatively smooth and rounded; interparietal rudimentary; lambdoidal crest well developed, curving forward, interrupted medially and branching forward in two indistinct diverging lines; zygomatic not especially expanded, anterior border sloping backward; bullae moderately large; nasals evenly tapered and ending posteriorly short of frontal premaxillary processes. Incisors projecting abruptly forward, narrow and deeper than broad; molariform teeth as in *E. fuscocapillus* Blyth; third upper molar with two inner and three outer angles as in that species; anterior palatine foramina very small.

Measurements of type: head and body, 125; tail vertebrae, 5; hind foot including claws, 22. Skull: condylo-incisive length, 33; condylo-basal length, 31; basilar length, 27; palatal foramina, 1.7; interorbital breadth, 5.5; zygomatic breadth, 21.6; nasals,  $8.6 \times 3.2$ ; alveoli of upper molar series, 7.6; width of incisors, 1.3; depth of incisors, 1.45; bullae,  $8.7 \times 5.8$ .

REMARKS.—*Ellobius f. legendrei* may be recognized by its bright color, complicated shape of the last upper molar and smooth rounded braincase. Compared with *lutescens* from Kurdistan, *legendrei* is brighter colored with a darker head, lighter underparts and lacks the pronounced sagittal crest of that race. *E. farsistani* Ugarov from the Persian Kopet-Dagh is larger than *legendrei* (head and body, 145 mm.; basal length of skull, 33.3). Ugarov's figure of the skull closely outlines that of *fuscocapillus* Blyth, and Vinogradov (1933) lists the Kopet-Dagh *Ellobius* under the latter species. *E. fuscocapillus* from the mountains of Afghanistan is a larger race than the new form with a very pronounced sagittal crest that joins the lambdoidal crest at right angles. *E. fusciceps* Thomas from Samarkand has incisors less projecting than normal; nasals extending to posterior processes of premaxillary and third upper molars about as in number 9-10 of Büchner's plate, much less complex than in *legendrei*. *E. t. transcaspiae* from Transcaspia, *ognevi* from Buchara and *woosnami* from Isfahan are all races of the smaller *talpinus* group with  $M^3$  more or less simple and compact and need no comparison with the present race.

### *Apodemus sylvaticus chorassanicus* (Ognev and Heptner)

Persian Yellow-shouldered Mouse

A large pale-colored woodmouse of the *sylvaticus* group with a tail longer than head and body, similar to *A. s. mystacinus* Danford and Alston but size smaller. Color of the present series is pinkish buff mixed with long black hairs, darkest on the middorsal region and almost clear buff on shoulders. Tail drab above, white below; a narrow buffy area on chest, underparts including most of fore limbs and fore and hind feet white; basal color of hair deep neutral gray. Skull slender with

rounded braincase, zygomata weak and not expanded, superior outline of skull rounded; anterior palatine foramina rather long and narrow.

Measurements of an adult male from Hairleigh, one from Dasht and an adult male and female from Dergermatie: total length, 190, 215, 210, 180; tail vertebrae, 103, 110, 120, 90; hind foot including claws, 24, 25, 24, 23. Skull: greatest length, 27.3, 26.7, 27.2, 26.0; interorbital breadth, 4.2, 4.2, 4.2, 4.3; zygomatic width, 13.4, 13.3, 13.7, 13.3; length of upper molar series, 3.8, 3.6, 3.8, 4.0.

REMARKS.—*Apodemus s. chorassanicus* appears to be widely distributed in the high country of northeastern Iran. It frequents the rocky arid mountain slopes and is not found in lowlands or heavily vegetated country.

Specimens: Hairleigh, 2; Dergermatie, 5; Dasht, 3.

#### *Apodemus arianus* (Blanford)

##### Iran Woodmouse

A large rich-colored woodmouse with tail about equal to or shorter than length of head and body. Color ochraceous tawny mixed with long black hairs, darkest down middorsal line and brighter and richer colored on rump. Underparts, including fore and hind feet and underside of tail, white; upperside of tail, dark drab; basal color of hair above and below, deep neutral gray. Skull broad, strong and angular with large teeth; interorbital region rims extending in low ridges across parietals.

Measurements of an adult male from Dar Kaleh, sea level; an adult female from Gouladah, 3000 feet, and an adult female from Dasht, 5000 feet: total length, 215, 210, 215; tail vertebrae, 105, 100, 105; hind foot including claws, 25, 25, 26. Skull: greatest length, 28.7, 28.2, 28.3; condylobasal length, 25.7, 26.2, 25.9; zygomatic breadth, 13.7, 14.1, 14.1; interorbital breadth, 4.4, 4.2, 4.1; length of nasals, 10, 10.2, 10; length of maxillary tooththrow, 4, 4.1, 4.

REMARKS.—This mouse is an inhabitant of forested country and is apparently widely distributed in suitable localities

throughout northeastern Iran from sea level to over 5000 feet elevation.

Specimens: Dar Kaleh, 12; Gouladah, 29 (12 in spirits); Dasht, 3.

#### *Calomyscus elburzensis* Goodwin

##### Elburz Vesper Mouse

A small light-colored, hairy-tailed mouse very similar in cranial and external characters to the American white-footed mouse, *Peromyscus crinitus*. Color pinkish buff, washed with blackish mouse-gray, darkest on middorsal region. Underparts including fore and hind feet and well up on sides of face, white to base of hairs; tail equal to length of head and body, clove brown above, white below.

Measurements of a semi-adult male and an adult female from Dergermatie: total length, 155, 160; tail vertebrae, 75, 80; hind foot including claws, 20, 21. Skull: greatest length, 24.5, 25; condylobasal length, 21.4, 21.9; length of nasals, 9.5, 9.4; zygomatic width, 12.2, 12.8; maxillary tooththrow, 3.2, 3.3

*Calomyscus* inhabits the bleak barren rocky mountain ridges at a considerable elevation. *C. elburzensis* is smaller than *C. bairdardi* from west central Iran with much smaller ears and distinctive cranial characters. It is similar to *C. hotsoni* from Baluchistan in general but differs from the latter in larger size, shorter tail and smaller ears.

Specimens: Dergermatie, Khorkout range, altitude 4000 feet, 5.

#### *Mus musculus kaleh-peninsularis*, new subspecies

##### Kaleh Peninsula Mouse

TYPE.—No. 88822, Amer. Mus. Nat. Hist.; adult ♀; Kaleh Peninsula, Mazandaran, Iran, 80 feet below sea level; collector, G. G. Goodwin, October 16, 1938. The type is a skin and skull in fair condition. Besides the type there is an adult male topotype, two semi-adult males and four skulls.

GENERAL CHARACTERS.—A medium-sized house mouse with pinkish-buff underparts; tail practically unicolored and about equal in length to head and body.

DESCRIPTION.—Upperparts snuff brown, the hair dark neutral gray at base, tipped with ochraceous buff and mixed with black hairs; sides of body paler than back; fore and hind

feet and toes buffy white; tail dusky above, slightly paler below; underparts light pinkish buff, hairs grayish at base; skull relatively large but normal for the species.

Measurements of the type and male topotype in parentheses: total length, 165 (135); head and body, 90 (73); tail vertebrae, 75 (62); hind foot including claws, 20 (17). Skull: condylobasal length, 21.6; zygomatic breadth, 11.8 (11.7); palatal foramina, 5.5 (5); alveoli of maxillary tooththrow, 3.7 (3.5).

REMARKS.—*Mus musculus kaleh-peninsularis* was taken on the sand dunes at the extreme end of the Kaleh Peninsula. It is readily distinguished from the *Mus* on mainland, referred to by me as *severtzovi* Kaschkarov, by its smaller size, darker color and buffy instead of white underparts. *M. m. formosovi* Heptner from Daghestan is a dark-colored race with underparts smoke gray, this color extending down limbs and feet to base of toes. *M. m. nogaiorum* Heptner, from Kislar, and *M. m. funereus* Ognev, from northwest of the Caspian Sea, are both comparable with *M. m. hortulanus*. *M. m. tataricus* Satunin from eastern Transcaucasia is described as grayish brown mixed with fox red; underparts white; tail shorter than head and body, apparently very different from the Kaleh Peninsula specimens.

### **Mus bactrianus severtzovi** (Kashkarov)

Transcaspien House Mouse

A small mouse with short, rather coarse, fur; tail shorter than head and body; indistinctly bicolored. Skull small with small teeth and anterior palatine foramina extending posteriorly between the first molars. Color varying from uniform clay color to dark drab; underparts including fore and hind feet white, white to roots of hair in most specimens but not all; small brown spots scattered irregularly over underparts of some individuals.

Measurements of an adult female from the Turkman desert and one male from Dar Kaleh and one male from Dasht: total length, 158, 165, 160; tail vertebrae, 75, 80, 70; hind foot including claws, 18, 19, 18.5. Skull: greatest length, 21.4, 23, 23.1; condylobasal length, 20.2, 21.5, 21.7; length of nasals, 7.3, 8.3, 8.5; interorbital breadth, 3.3, 3.5, 3.5; zygomatic breadth, 11.5, 11.7, 11.7; alveoli

length of maxillary tooththrow, 3.4, 3.4, 3.5.

REMARKS.—Externally the Iran specimens are identical with typical *severtzovi* from Tashkent and in cranial characters there is not much difference. The Iran skulls are somewhat more rounded, braincase more inflated and interorbital region less ridged than typical specimens. In the lowlands this mouse was found in the grass country as well as the arid plains, none was taken in timbered country at higher altitudes where it was found only in the rocky and more or less arid valleys.

Specimens: Turkman desert, 3 (2 in spirits); Dar Kaleh, 7; Dasht, 8 (3 in spirits).

### **Rattus rattus alexandrinus** (Geoffroy)

Alexandria Rat

Two rats from Dar Kaleh are clay-colored mixed with long black hairs on back; sides of body pale buff and black, base of hairs deep neutral gray; underparts including fore and hind feet creamy white to base of hairs. They have long tapering tails, dusky, practically unicolor and normal for this species. The skulls are rather small and the posterior border of the palate extends 0.5 mm. beyond the back of the last molar, a character said to be applicable to *R. turkestanicus* Satunin. The latter species, however, has a sharply bicolored tail, underside white. A short palate is not uncommon in series of *alexandrinus*.

Measurements of two adult males from Dar Kaleh: total length, 385, 362; tail vertebrae, 215, 205; hind foot including claws, 35, 35. Skull: greatest length, 40.5, 38.4; condylobasal length, 37.8, 35.75; zygomatic breadth, 19.5, 18.4; upper molar series, 6.4, 6.5.

Specimens: Dar Kaleh, 7 (5 in spirits).

### **Nesokia huttoni bailwardi** Thomas

Bailward Bandicoot

A series of bandicoots from the southwest Turkman desert and the adjacent farm country agree in general character with the type description of *bailwardi*. Colors, however, vary from bright snuff brown and



ochraceous tawny to cinnamon buff instead of wood brown as given by Thomas for this species. The ear measurement, 24 mm., in the type description may be an error as this measurement (from notch) in an adult male in spirits is 17.7.

Measurements of two males and one female from the Turkman desert: total length, 325, 285, 330; tail vertebrae, 140, 120, 140; hind foot, 40, 38.3, 40. Skull: condylobasal length, 41.2, 42.2, 41.1; basilar length, 35.8, 36.8, 35.8; length of nasals, 12, 12, 11.6; zygomatic breadth, 26.3, 27.3, 25.6; interorbital breadth, 6, 6, 6; alveoli maxillary toothrow, 8.8, 8.5, 9.

REMARKS.—The present series were taken about 65 kilometers east of Bandar Gaz, the type locality for *bailwardi*, in similar low flat country and usually in moist areas near springs or watercourses. The type of *N. boettgeri* came from the banks of the Amu Darya and *N. satunini* from the Merv Oasis. These two localities are close together and it has generally been assumed that they represent but one form. The measurements in the type description of *boettgeri*, tail 46 and head 95, were probably transposed. The dark color described in both species is very different from the bright tawny color of the Dar Kaleb specimens.

Specimens: Dar Kaleb, 5 (2 in spirits); Turkman desert, 8 (5 in spirits).

### *Nesokia insularis*, new species

#### Main Kaleb Peninsula Bandicoot

TYPE.—No. 88845, Amer. Mus. Nat. Hist.; adult ♂; east end of the Main Kaleb Peninsula, south shore of the Caspian Sea; altitude 80 feet below sea level; collector, G. G. Goodwin, October 15, 1938. The type is a skin and skull in good condition. Besides the type there are eight topotypes.

GENERAL CHARACTERS.—A dull brownish-gray bandicoot with short tail and very coarse, thin pelage about 10 mm. in length on middle of back. Mammae, eight.

DESCRIPTION.—Upperparts clay color, mixed with long black hairs giving a Saccardo's umber effect; sides of body dull pinkish buff; underparts soiled, light buff; basal color of hair dark neutral gray, the pale tips barely covering the dark basal color on sides and underparts. Fore feet, soiled whitish; ears, hind feet and tail, dusky. Skull large, deep and angular, supra-orbital ridges very thick and heavy at the

postorbital processes and extending in low ridges across parietals; superior outline of skull arched; molariform teeth broad, the first molar proportionally large.

Measurements of type and an adult male and female topotype: total length, 320, 315, 315; tail vertebrae, 120, 135, 120; hind foot including claws, 40, 38, 36. Skull: condylobasal length, 46.4, 44.1, 43.6; basilar length, 40.4, 38.6, 38.5; palatal length, 24.3, 23, 22.8; length of nasals, 14.3, 13.2, 13.5; zygomatic breadth, 28.3, 26.6, 27.3; interorbital breadth, 6.5, 6.5, 6.5; greatest width across supraorbital ridges, 11.5, 12.5, 11; greatest palatal frontal depth, 16.5, 16, 15.6; alveoli of upper toothrow, 9.6, 9.2, 9.4; crowns, 7.2, 6.8, 7.1.

REMARKS.—*N. insularis* may be recognized by its very coarse, thin pelage, large size and short tail. Superficially, except for its shorter tail, resembles a Norway rat. It was found inhabiting the growth of tall reeds along the water's edge. It is surprising to find a new race of bandicoot so near to the type locality of *N. bailwardi* Thomas which, however, is on the mainland just across the bay. The latter species is a smaller animal with smaller teeth and soft pelage as in typical *huttoni*, a character which in no sense could be applied to *insularis*. A review of the described races may show that this new form is closely allied to *dukelskiana* from Samarkand and possibly *boettgeri* or *satunini* and represents a coarse-pelaged short-tailed group contrasting with the soft fine pelage and relatively long tail of the *huttoni* group.

### *Nesokia legendrei* Goodwin

#### Legendre Bandicoot

A large cinnamon-buff bandicoot with long, full, rather coarse pelage mixed with long black semi-spinous guard hairs. Skull relatively long and narrow, with large molars; unworn dentition shows a conule on the anterior inner side of second molar and an inner and outer conule on anterior side of third molar.

Measurements of two males, the type and a semi-adult topotype: total length, 395, 335; tail vertebrae, 170, 140; hind foot including claws, 41, 40; ear in dried skin, 17.5, 16. Skull: condylobasal length, 51, 44.5; zygomatic width, 30, 27.3; length of nasals, 14.3, 12.6; alveoli of upper toothrow, 10.4, 8.9.

REMARKS.—*Nesokia legendrei* was found inhabiting dry hill tops at an elevation of 3200 feet in open rolling country. There was no evidence of this bandicoot in the more fertile meadows and valleys nearby. Only one individual was found in a burrow and the burrows were widely separated.

Specimens: Gouladah, 2.

***Allactaga elater turkmeni*, new sub-species**

Turkman Gerboa

TYPE.—No. 88748, Amer. Mus. Nat. Hist.; adult ♂; Turkman plains, Iran, about 60 kilometers east of Astrabad on the banks of the Gurgan River; altitude sea level; collector, G. G. Goodwin, October 27, 1938. The type is a skin and skull in fair condition. Besides the type there are three topotypes: one adult ♀, one immature ♀ and an adult ♂ in spirits.

GENERAL CHARACTERS.—A medium-sized dark-colored gerboa about the size of typical *elater* but with ground color pinkish buff instead of pale yellow orange.

DESCRIPTION.—General color of upperparts dark drab; the hairs deep neutral gray from base for most of their length, followed by a narrow band of pinkish buff and tipped with black; head clearer pinkish buff than back; ears deep neutral gray with a relatively narrow strip of buffy along anterior border; outside of hind limbs and an indistinct lateral line capucine buff; the usual white band across hips and a neutral gray area behind limbs; tail and brush normal for the *elater* group; hind feet pinkish buff; underside of body and fore limbs white to root of hair. Skull similar to typical *elater* but larger, with larger teeth. Posterior border of anterior palatine foramina ending at a line across the front of premolars.

Measurements of type, female topotype and male in spirits in parentheses: total length, 260 (265, 238); head and body, 108 (100, 90); tail, 152 (165, 148); hind foot, 54 (55, 51); ear from notch in dried skin, 27.5 (25.5, 29.5). Skull: greatest length, 27.9 (27.4); basilar length, 22.4 (21.5); length of nasals, 8.5 (8.5); zygomatic width, 20.9 (20.5); interorbital width, 9.5 (9.8); diastema, 7.8 (7.5); palatal foramina, 4.6 (4.6); upper molariform tooth-row 5.2 (5.5); width of first upper molar, 1.8 (1.7).

REMARKS.—*Allactaga e. turkmeni* may be distinguished from *elater* by its darker and more ochraceous color, larger ears, larger teeth and shorter feet. *Allactaga e. strandi* Heptner is equal to *turkmeni* in size but it is described as having a paler sandy ground color than the typical form and the measurements of ears are given as 29.5–39, which would be a much greater

average than in *turkmeni*. *Strandi* comes from the sandy wastes near Merv which is separated from the range of *turkmeni* by the Kopet-Dagh Mountains. *Allactaga e. dzungariae* is also a dark race but differs in distinctive cranial characters. An adequate description has not been published of *A. e. caucasicus* Nehring from the Mugan Steppes southwest of the Caspian. Both *caucasicus* and *aralychensis* from the foot of Mt. Ararat seem to be larger races; the latter is a brighter colored form with a shorter hind foot than *turkmeni*.

The present series was taken on the mud flats along the Gurgan River.

***Hystrix hirsutirostris satunini* Müller**

Transcaspien Porcupine

A large porcupine with a crest of long spiny bristles from head to shoulders, quills long with alternate rings of mummy brown and white; tail quills practically all white; shoulders mummy brown, the bristles flattened; top of head and around ears light drab; a white collar on underside of neck to front of shoulders; underparts including fore and hind feet brownish black; skull large and massive.

Measurements of an adult male from border of Turkman plains: total length, 850; tail vertebrae, 140; hind foot including claws, 103. Skull: greatest length to front of incisors, 163; condylobasal length, 149; palatal length, 82; zygomatic breadth, 82; length of nasals, 69.4; breadth of nasals, 37.5; least frontal breadth, 57.2; least postorbital breadth, 49; interorbital breadth, 63; alveoli of upper toothrow, 32.1.

Porcupines are not uncommon on the plains northeast of the Caspian Sea, especially in the bordering brush country.

Specimens: border of Turkman plains, 2.

***Lepus europaeus iranensis* Goodwin**

Iran Plateau Hare

A large hare with curly buff-colored pelage, large ears and a conspicuous black area on upperside of tail. Similar to European species of the group but relatively smaller and color more pinkish. Skull

shorter, braincase broader and bullae larger than typical *europaeus*.

Measurements of two adult males from Teheran: total length, 600, 600; tail vertebrae, 59, 58; hind foot including claws, 150, 145; ear from notch in dried skin, 112, 108. Skull: greatest length, 96.3, 97; occipitonasal length, 93.5, 93; condylobasal length, 85.5, 85.5; zygomatic breadth, 46.2, 48; postorbital constriction, 13.3, 15.3; breadth of nasals, 21.7, 22.7; length of nasals, 39.5, 40.4; alveoli of maxillary tooththrow, 17, 17.

The Iran hare inhabits the high plateau country of north central Iran. It is replaced in the Mazandaran, Turkmania and coastal regions by a smaller hare of the *tolai* group.

Specimens: Teheran, 2.

***Lepus tolai turcomanus* (Heptner)**

Turkman Hare

Similar to *L. t. lehmani* Severtzoff but color darker and pelage shorter and coarser. Color of Mazandaran specimens, pale pinkish buff washed with black producing a grizzled effect. Outside border of ears in front cinnamon buff with a narrow margin of black round tip, back of tip blackish; hind feet varying from pinkish buff to grayish white; thoracic and inguinal regions, and a broad line down the middle of abdomen, white; area between white of underparts and color of sides of body pinkish buff, this color more or less suffusing the entire underparts in one adult female.

Measurements of adult male and female from Dar Koleh: total length, 555, 500; tail vertebrae, 90, 75; hind foot including claws, 125, 115; ear from notch in dried skin, 94.6, 89. Skull: greatest length, 86.2, 87.2; condylobasal length, 75, 76.5; zygomatic breadth, 40.9, 40.3; length of nasal suture, 32.4, 32.1; postorbital constriction, 11.5, 12.8; alveoli maxillary tooththrow, 16.2, 16; diameter of bullae, 12, 12.

REMARKS.—Hares were occasionally seen in the thick brush country southeast of the Caspian. Specimens from Dar Koleh agree in all essential characters with Heptner's description of *turcomanus* from south-

western Kara Kum desert except the length of maxillary tooththrow, 24.8, which is probably an error and should read 14.8.

Specimens: Dar Koleh, 4.

***Lepus tolai desertorum* Ognev and Heptner**

Turkman Desert Hare

Characterized by its small size, pale color and black ear tips. Two specimens from the sand dunes of the Main Koleh Peninsula are here provisionally referred to this race. Externally, except for smaller size and more extensive white on underparts, they are not very different from the mainland species. The skulls, however, are smaller than those of the Dar Koleh specimens, with more slender postorbital processes and noticeably smaller bullae though the maxillary tooththrow is about the same.

Measurements of a semi-adult male and a slightly younger specimen, both from the Main Koleh Peninsula: total length, 490, 490; tail vertebrae, 85, 90; hind foot, 110, 110; ear from notch in dried skin, 90, 88.8. Skull: greatest length, 78, —; condylobasal length, 69, —; greatest length of nasals, 32.2, 32.2; postorbital constriction, 13.3, 13.4; zygomatic width, 38.5, 38; diameter of bullae, 10.9, 10.6; alveoli of maxillary tooththrow, 14.7, 14.

REMARKS.—In size these specimens from the Koleh Peninsula are close to Ognev's measurements of *desertorum* from the sandy desert at Annau near Ashkabad. They are, however, not fully adult and may be local variations of *turcomanus*.

Specimens: sand dunes near extreme tip of the Main Koleh Peninsula, 2.

***Sus scrofa attila* Thomas**

Transsylvania Wild Boar

Mazandaran specimens are buffy brown in color, the hairs blackish for three-quarters of their length followed by a band of light buff, tips of hairs frayed and about clay color; fore limbs and feet, hind feet to heel black; a more or less light area on cheeks, this color extending over most of the face in some specimens; bristles longer and coarser down middle of back from



shoulders to rump. Skull large, rostrum elongated, profile in males inclined at an angle to base of skull from posterior nasal region; female skulls more slender and elongated than males, upper profile practically a straight line.

Measurements of an adult male and female from the Mazandaran: total length, 1520, 1600; tail, 230, 220; hind foot, 360, 330. Skull: greatest length overall, 412, 410; condylobasal length, 347, 349; palatal length, 240, 243; nasal suture, 203, 214; zygomatic breadth, 165, 155; alveoli length of upper toothrow, 125, 124; last upper molar,  $40 \times 23.9, 39.8 \times 22$ .

REMARKS.—Adlerberg in his synopsis of Russian and Mongolian wild boars refers his specimens from northern Persia on the shore of the Caspian to *attila* though he states that the Transcasian and northern Persian wild boars may rate a separate geographical race.

Specimens: Dar Koleh, 3.

### **Capreolus capreolus armenius** Blackler

Armenian Roe Deer

Two female roe deer from eastern Mazandaran, collected about October 27, 1938, are in short, fresh fall pelage. General color: near sepia, darkest on back, the longer unshed summer pelage ochraceous tawny; lower fore and hind limbs and feet, ochraceous buff.

Measurements of an adult female, not old, from Dar Koleh and the type, a female from Trebizond, in parentheses: total length, 960 (1080); hind foot, 330 (330). Skull: greatest length, 184 (189); condylobasal length, 174 (180); greatest breadth, 79 (87.2); interorbital breadth, 45.1 (50); length of nasals, 49.5 (48.8); alveoli maxillary toothrow, 60 (58); length of upper molar series, 34.5 (34.5).

REMARKS.—The Mazandaran roe deer is apparently referable to Blackler's dark race, *C. c. armenius*, and very different from the pale gray form, *C. coxi* Chessman and Hinton from Kurdistan, northwest Persia. Roe deer are not uncommon in the hill country along the south shore of the Caspian Sea.

Specimens: Dar Koleh, 2.

### **Cervus elephas maral** Ogilby

Caspian Red Deer or Maral

The Caspian red deer is a large heavily built race with dark buffy gray pelage, large antlers, tines seldom exceeding eight in number and frequently only five or six. Color of an adult male, killed November 21 at Dasht, is dark mouse gray; hairs with a subterminal band of pale buff; hips, limbs and feet mummy brown grading to near dark sepia on underparts; rump patch bright cinnamon. A young female from the Mazandaran is similar in color except that the buffy spots of the fawn pelage have not quite disappeared.

Measurements of an adult male from Dasht: total length, 1660; hind foot, 510. Skull: greatest length, 407; condylobasal length, 390; length of nasals, 145; greatest breadth, 167; maxillary toothrow, 113; upper molar series, 65.

REMARKS.—The Maral stag inhabits the forested regions in northern Iran from the Caspian Sea to at least 5000 feet elevation.

Specimens: Dasht, 2 (1 skin and skull, 1 skull); Gouladah, 1 (skull only); Dar Koleh, 2 (1 juv. skin and skull, 1 skull).

### **Ovis vignei arkal** Blasius

Turkman Urial

A bright-colored sheep. Rams with a large white ruff on throat and slender horns which, when fully developed, curve forward below eye; ewes with shorter and straighter horns. Color of males from the upper Gurgan drainage, in November pelage: upperparts uniform ochraceous tawny; sides of face in rams hair-brown mixed with white; a hair-brown lateral stripe broadest behind fore limbs separating the white of underparts from color of back and extending down upper limbs, and in some individuals down lateral side of feet, to hoofs; feet white or buff.

Measurements of an adult male and female from Hairleigh: total length, 1330, 1330; tail, 100, 90; hind foot, 390, 355. Skull: greatest length, 280, 255; condylobasal length, 262, 245; greatest breadth, 146, 133; length of nasals, 105, 103; maxillary toothrow, 71.5, 72.5; upper molar series, 47.6, 49.5; horns, including fully developed pair: outside

curve, 630, 320, 900; circumferences at base, 263, 112, 280.

REMARKS.—The present series show little individual variation in general coloration. Some specimens, however, have pure white feet while in others the feet are mixed hair-brown and white. Cranial characters are fairly constant throughout the series with the exception of the posterior palatal notch which varies from a rounded egg shape to a sharp V which in one individual cuts through to the maxillary.

Specimens: Hairleigh, 4; Dergermatie, 6.

### ***Capra hircus aegagrus* (Pallas)**

Persian Wild Goat

The horns of the Persian wild goat have a sharp keel on the front inner edge and a small number of prominent widely separated knobs. The horns are marked with fine transverse lines and more distinct annual growth lines, although occasionally divergent the tips usually incline inward. In color, the Persian goat varies seasonally. Specimens collected in November are mixed ochraceous-tawny and white on upperparts, the white most pronounced on shoulders; a blackish middorsal line from head almost to base of tail; tail black; beard black; a narrow black lateral line separating the white of underparts from back and extending down front of limbs to hoofs, broken on the front legs at knee; lower part of neck and chest washed with black; feet buffy white; face darker than body and mixed with black hairs.

Measurements of adult male from Dergermatie, Khorkout range: total length, 1370; tail, 150; hind foot, 318. Skull: greatest length, 259; condylobasal length, 249; greatest breadth, 129; nasals, 78.5; maxillary tooththrow, 74.9; upper molar series, 50.8. Horns: outside curve, 780; circumference at base, 20.5.

Specimens: Hairleigh, 2; Dergermatie, 1; Iran, 1 (skull).

### ***Gazella subgutturosa subgutturosa***

Güldenstädt

Persian Gazelle

A small sandy colored gazelle, females hornless, horns in males lyrate, tips turned

inward, side view slightly S-shaped, rings strongly marked. Color of specimens from Siah Parde, near Teheran, in September pelage: upperparts cinnamon buff, paler on thighs; pinkish-buff lateral lines; a dark transverse band at edge of white on rump; top of head whitish, facial markings indistinct but the usual pale lateral bands present; front of limbs and feet like back; underparts up to base of tail on rump white; tail black.

Measurements of a male from Siah Parde, with premolars in place but unworn, and a male from Turkman desert, about the same age: total length, 1200, 1100; tail vertebrae, 195, 170; hind foot, 350, 330. Skull: condylobasal length, 204, 193.5; basal length, 192, 183; greatest breadth, 94, 90; interorbital breadth, 55.5, 49.2; length of nasals, 44.7, 54; breadth of nasals, 23.5, 22.8; maxillary tooththrow, 68, 67.2; upper molar series, 42.4, 42.9. Horns: length, 260, 310; circumference at base, 110, 105.

Specimens from Siah Parde and the Turkman desert are apparently referable to *subgutturosa*. A semi-adult male from the broken undulating country near Gouladah was collected in November and has thick full pelage, distinct facial markings and the white on the rump barely reaches the base of the tail; characters referable to *G. seistanica* Lydekker; the skull is relatively massive though measurements are normal; the nasals and tooththrow are perceptibly larger and bullae decidedly more pinched than in the rest of the series. This specimen, however, seems inseparable from typical *subgutturosa*.

Specimens: Siah Parde, 2; Turkman desert, 2; Gouladah, 1; central Iran (1 set of horns).

### ***Equus hemions onager* Pallas**

Persian Wild Ass

Ears small; dorsal stripe from nape of neck including mane to tail narrow on the shoulders and becoming very broad (65 mm.) behind saddle; a dark transverse shoulder stripe sometimes present and occasionally transverse rufous stripes on limbs. Three skins from Siah Parde are

variable in color: one sub-adult male in close summer pelage, avellaneous with a cinnamon-brown dorsal stripe and a faint transverse shoulder stripe; a female or young male in summer pelage, light pinkish cinnamon with a tawny stripe, a faint shoulder stripe and six well-marked transverse tawny stripes on upper hind limbs about 40 mm. apart; the third, an adult male in thick curly winter pelage, sayal brown with a mummy-brown dorsal stripe and without transverse shoulder stripe.

Measurements of three and one-half years old male, skin and skull, and a skull of five and one-half years old male: total

length, 2200; tail vertebrae, 350; hind foot, 520. Skull: occipito-incisive length, 498, 494; condylobasal length, 443, 445; palatal length, 225, 222; greatest breadth, 185, 186; interorbital breadth, 120, —; postorbital breadth, 85, 76; median nasal suture, 184, —; length of upper maxillary toothrow, —, 165; without last molar, 144, 140.

Specimens: Siah Parde, 3 (one complete skin and skull, 3 1/2 years old, last molar not in place; one skull and skin without hoofs, 5 1/2 years old; one skin without feet and head, probably from the above locality).



